



Draft
Delisting Decision
for
Toulmins Spring Branch
for
Ammonia

Assessment Unit ID # AL03160204-0504-300

Alabama Department of Environmental Management
Water Quality Branch
Water Division
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Figure 1: Toulmins Spring Branch Location Map in the Mobile River Basin

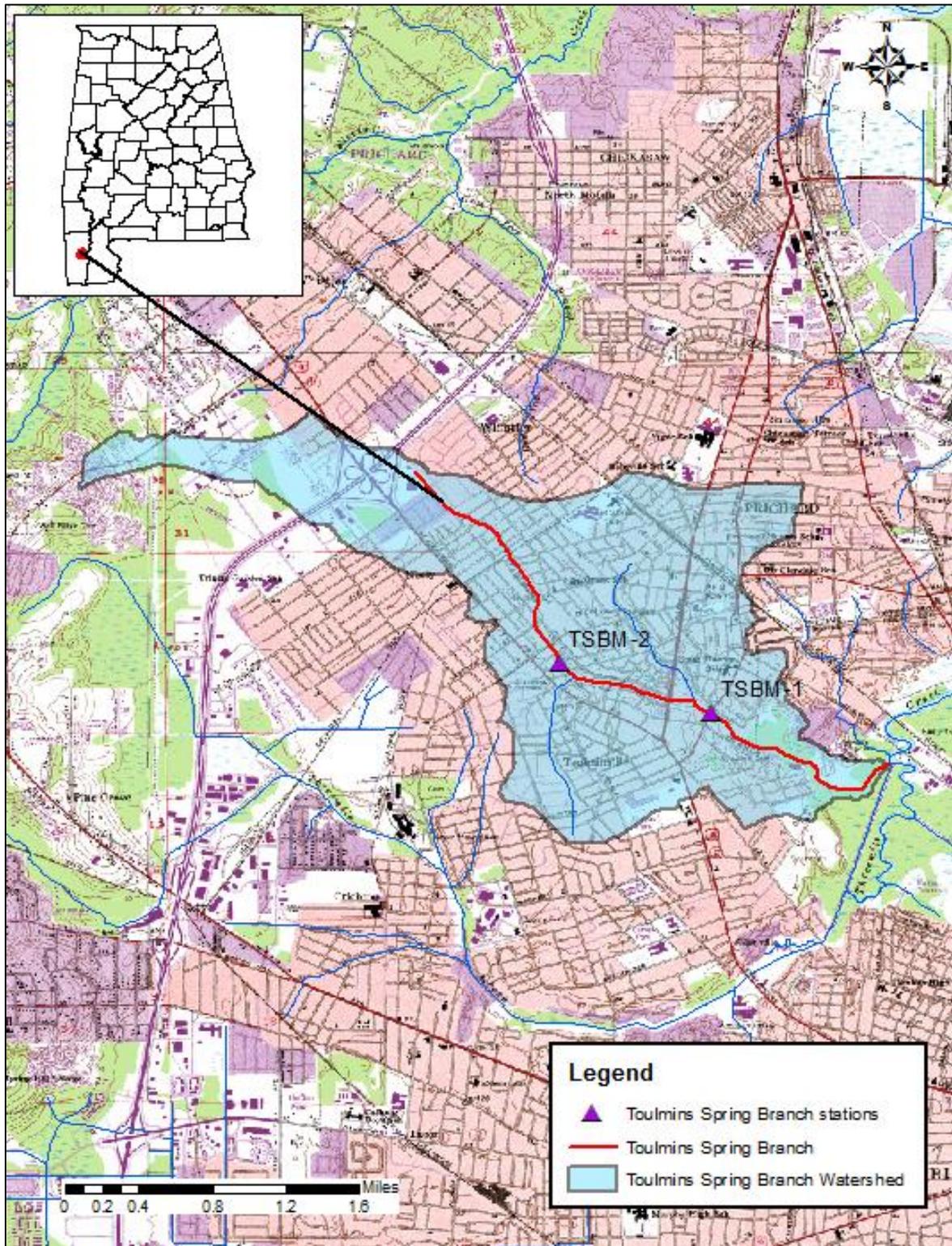


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1.0 Executive Summary

Toulmins Spring Branch is a part of the Threemile Creek watershed located near the cities of Mobile and Prichard in southwest Alabama. It has a length of 3.22 miles and a total drainage area of 3.97 square miles. It has a use classification of *Fish & Wildlife (F&W)*. The small coastal stream begins in southeastern Prichard and travels in a southeasterly direction until it flows into Threemile Creek just above Conception Street in Mobile. The entire watershed is a part of the Mobile Area Phase I Municipal Separate Storm Sewer System (MS4) permit.

Toulmins Spring Branch was first placed on the State of Alabama's §303(d) List for ammonia-nitrogen (NH₃-N) and nutrients in 2008 as a result of water quality data collected by the United States Geological Survey (USGS) in 2000 and 2001. Subsequent data from the Alabama Department of Environmental Management's (ADEM) surface water quality monitoring program have shown no impairment with respect to ammonia.

The most recent water quality data available for Toulmins Spring Branch was collected in 2011 and 2012. ADEM collected 8 samples at TSBM-1 and 9 samples at TSBM-2. All of the most recent samples collected were below the instream water quality standard for ammonia based on chronic toxicity. The numeric endpoints for ammonia, or Criteria Continuous Concentration (CCC) values, are listed in Tables 2 and 3.

The following report addresses the results of the delisting analysis for Toulmins Spring Branch for ammonia. Based on the assessment of all available water quality data, ADEM has determined that an impairment for ammonia does not currently exist. Therefore, ADEM will not develop a Total Maximum Daily Load (TMDL) in light of "more recent or accurate data," which is just cause for delisting a waterbody according to Title 40 of the Code of Federal Regulations (CFR), Part 130.7(b)(6)(iv).

2.0 Basis for §303(d) Listing

Section 303(d) of the Clean Water Act (CWA), as amended by the Water Quality Act of 1987 and EPA's Water Quality Planning and Management Regulations [(Title 40 of the Code of Federal Regulations (CFR), Part 130)], requires states to identify waterbodies which are not meeting water quality standards applicable to their designated use classifications. The identified waters are prioritized based on severity of pollution with respect to designated use classifications. Total maximum daily loads (TMDLs) for all pollutants causing violation of applicable water quality standards are established for each waterbody identified as impaired. Such loads are established at levels necessary to implement the applicable water quality standards with seasonal variations and margins of safety. The TMDL process establishes the allowable loading of pollutants or other quantifiable parameters for a waterbody, based on the relationship between pollution sources and instream water quality conditions, so that states can establish water quality-based controls to reduce pollution from both point and nonpoint sources and restore and maintain the quality of their water resources (USEPA, 1991).

The State of Alabama identified Toulmins Spring Branch as being impaired due to ammonia and nutrients for its entire length of 3.22 miles, as reported on Alabama’s 2008 §303(d) List of Impaired Waters. Toulmins Spring Branch is prioritized as “low” on each list. Toulmins Spring Branch is located in Mobile County and lies within the Mobile Basin (See Figure 1, page i). It was listed as impaired for ammonia based on data collected by the USGS in 2000 and 2001. The data showed that 4 samples out of the 8 collected exceeded the calculated ammonia criteria as shown in table 1.

Table 1. USGS Data: Toulmins Spring Branch at Graham Ave. Mobile, AL

Date	Dissolved Oxygen mg/L	pH	Temperature(°C)	Ammonia (NH3-N) mg/L	Calculated Ammonia Criteria
3/14/2000	11.7	8.4	24	0.34	0.7
4/26/2000	10.6	9.2	26.4	0.26	0.17
7/24/2000	11.7	9.9	35.3	0.31	0.05
9/13/2000	15.5	9.9	28.4	0.29	0.08
11/15/2000	11.4	7.7	15	0.47	3.47
2/12/2001	15.2	9.2	19	0.44	0.28
3/13/2001	8.9	6.6	17.9	1.3	5.28
10/31/2001	15.8	9.2	22.4	0.2	0.22

3.0 Technical Basis for Delisting Decision

3.1 Water Quality Target Identification

3.1.1 Ammonia as Nitrogen Criteria

ADEM’s water quality regulations do not provide numeric water quality criteria for ammonia. However, for purposes of listing and delisting decisions, ADEM relies upon a narrative criterion to address ammonia, which is detailed in the ADEM Administrative Code, R. 335-6-10-.06(c):

(c) State waters shall be free from substances attributable to sewage, industrial wastes or other wastes in concentrations or combinations which are toxic or harmful to human, animal or aquatic life to the extent commensurate with the designated usage of such waters.

For purposes of evaluating attainment of the above narrative criteria, ADEM will use EPA’s Ambient Water Quality Criteria for ammonia. The Municipal Branch and the Industrial Section of the Water Division of ADEM have adopted as policy EPA’s ammonia criteria for purposes of developing permit limits in National Pollutant Discharge Elimination System (NPDES) permits. EPA’s 1999 Update of Ambient Water Quality Criteria for Ammonia (EPA 822-R-94-014) provides the following equation for

calculating the chronic criterion, also known as the Criteria Continuous Concentration (CCC). This criterion is applied in streams with a designated use classification of Fish and Wildlife or higher.

$$CCC = \left[\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right] * \text{Min}[2.85, 1.45*10^{(0.028*(25-T))}] \text{ mg/l } NH_3-N$$

Ammonia was sampled at two different stations on the impaired segment of Toulmins Spring Branch. A CCC value for each sampling event was determined by taking the pH value with a temperature value to calculate the CCC value using the above equation. The following are examples of how the CCC value was calculated at stations TSBM-1 and TSBM-2. At station TSBM-1, on 10/12/11 the pH value was 6.68 SU and the corresponding temperature was 21.25°C which resulted in a CCC value of 4.19 mg/l. At station TSBM-2, on 11/08/12 the pH value was 6.1 SU and the temperature value was 12°C which resulted in a CCC value of 6.91 mg/l. These values will be used as the numeric ammonia endpoints for their respective stations and respective sampling events.

Another consideration in establishing an allowable instream ammonia concentration is its effect on the dissolved oxygen (DO) concentration due to oxygen demand through the conversion of ammonia to nitrite and subsequently nitrate. The DO criterion for Toulmins Spring Branch is 5.0 mg/l. Measured instream DO concentrations will be used to determine if ammonia is having an effect on the DO.

3.1.2 Data Availability and Analysis

It should be noted that even though Toulmins Spring Branch was sampled prior to 2011, only the data that is approximately six years in age or less will be used in this analysis, which is consistent with *Alabama's Water Quality Assessment and Listing Methodology* (ADEM, 2012).

The source of data that was utilized in the evaluation of Toulmins Spring Branch is from ADEM's 303(d) sampling program. Both physical and chemical data were collected at the following two sampling stations: TSBM-1 and TSBM-2. There were no exceedances of chronic criteria at either station as shown in Figures 2 and 3.

Therefore, the ammonia levels in Toulmins Spring Branch are below the chronic toxicity criterion for ammonia. The numeric endpoints for ammonia or Criteria Continuous Concentration (CCC) values are listed in Tables 2 and 3.

Figure 2: Station TSBM-1: Measured Ammonia vs. Chronic Ammonia Criteria

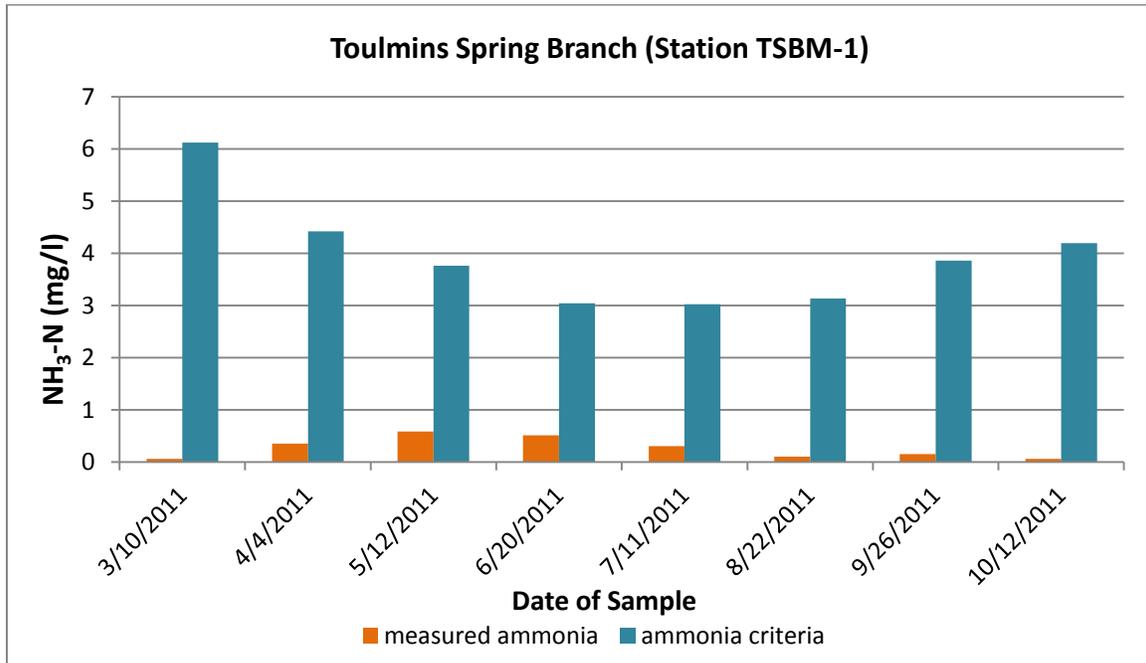


Table 2: Table of CCC values for Sampling Events at TSBM-1

Visit Date	Measured NH ₃ -N (mg/l)	Ammonia Criteria EPA NH ₃ -N CCC (mg/l)
3/10/2011	0.06	6.12
4/4/2011	0.35	4.42
5/12/2011	0.58	3.76
6/20/2011	0.51	3.04
7/11/2011	0.30	3.02
8/22/2011	0.10	3.13
9/26/2011	0.15	3.86
10/12/2011	0.06	4.19

Figure 3: Station TSBM-2: Measured Ammonia vs. Chronic Ammonia Criteria

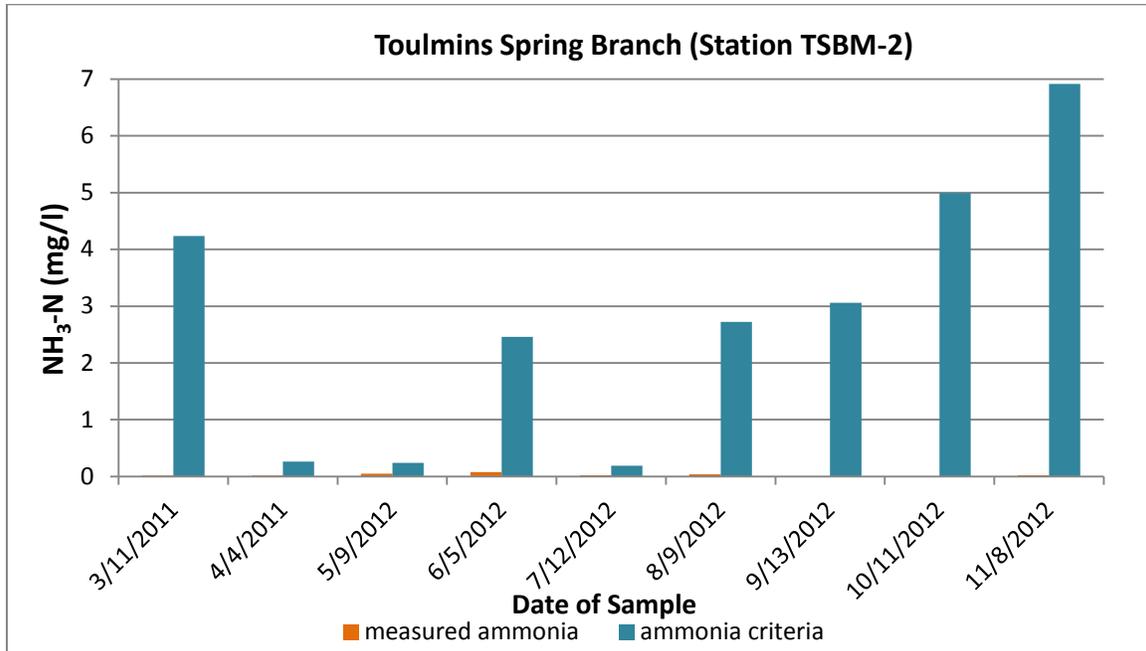


Table 3: Table of CCC Values for Sampling Events at TSBM-2

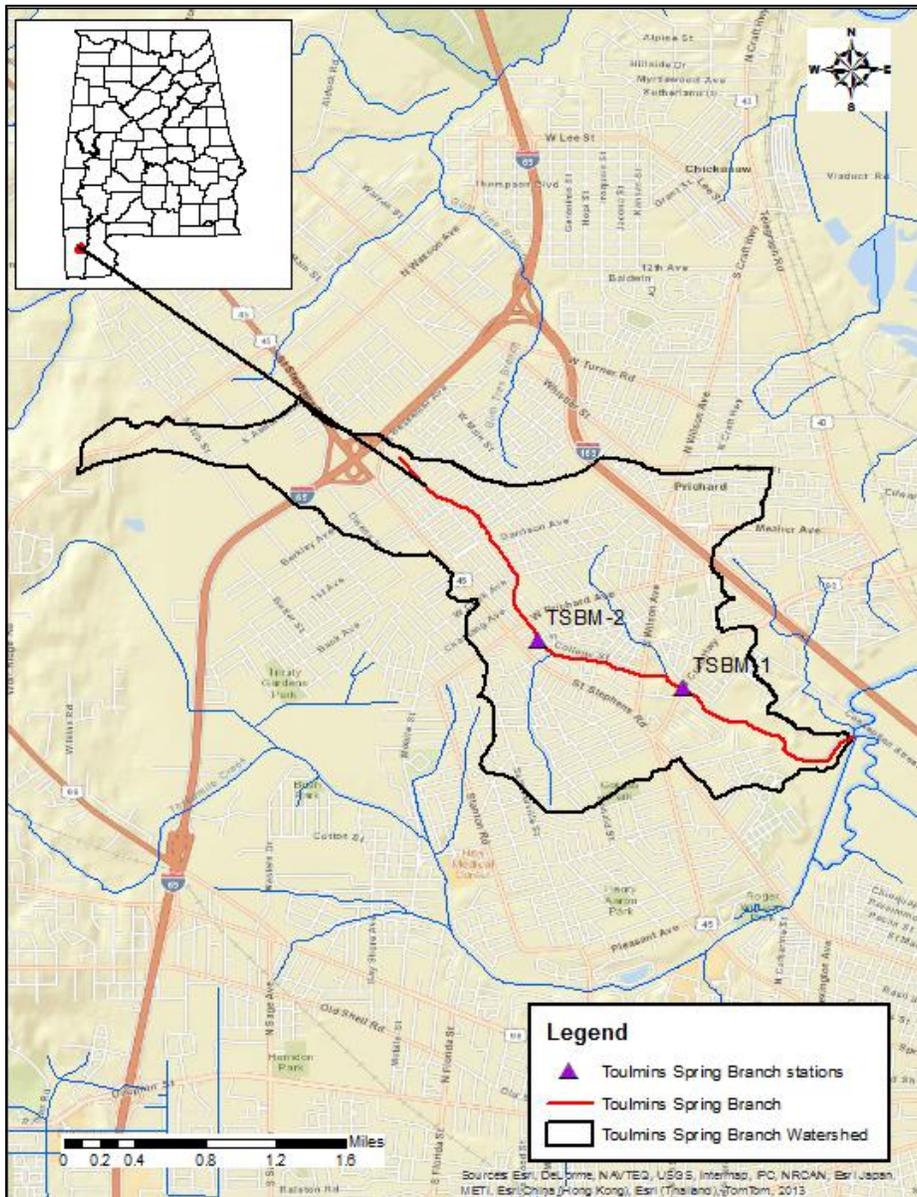
Visit Date	Measured NH ₃ -N (mg/l)	Ammonia Criteria EPA NH ₃ -N CCC (mg/l)
3/11/2011	0.014	4.24
4/4/2011	0.014	0.26
5/9/2012	0.050	0.24
6/5/2012	0.080	2.46
7/12/2012	0.020	0.19
8/9/2012	0.040	2.72
9/13/2012	0.005	3.06
10/11/2012	0.005	4.99
11/8/2012	0.020	6.91

A complete list of available data used in this delisting report can be found in Appendix 6.2. Refer to Figure 4 and Table 4 for sampling station locations for Toulmins Spring Branch.

Table 4: ADEM Sampling Stations in the Toulmins Spring Branch Watershed

Station Name	Agency Name	Latitude	Longitude	Description
TSBM-1	ADEM	30.72182	-88.08049	Toulmins Spring Branch at Craft Hwy.
TSBM-2	ADEM	30.72574	-88.0925	Toulmins Spring Branch at Graham Ave.

Figure 4: Map of Sampling Locations in the Toulmins Spring Branch Watershed



4.0 Conclusions

From examination of all available water quality data and information provided for Toulmins Spring Branch, ADEM has determined that an impairment due to ammonia does not currently exist. Therefore, ADEM will not develop a TMDL in light of “more recent or accurate data,” which is just cause for delisting a waterbody according to Title 40 of the Code of Federal Regulations (CFR), Part 130.7(b)(6)(iv). Toulmins Spring Branch will be proposed for delisting as a part of the development process for Alabama’s 2014 §303(d) List of Impaired Waters.

5.0 Public Participation

As part of the public participation process, this Delisting Decision (DD) will be placed on public notice and made available for review and comment. The public notice will be prepared and published in the major daily newspapers in Montgomery, Huntsville, Birmingham, and Mobile, as well as submitted to persons who have requested to be on ADEM’s postal and electronic mailing distributions. In addition, the public notice and subject DD will be made available on ADEM’s website: www.adem.state.al.us. The public can also request paper or electronic copies of the DD by contacting Mr. Chris Johnson at 334-271-7827 or cljohnson@adem.state.al.us. The public will be given an opportunity to review the DD and submit comments to the Department in writing. At the end of the public review period, all written comments received during the public notice period will become part of the administrative record. ADEM will consider all comments received from the public prior to finalization of this DD and subsequent submission to EPA Region 4 for final review and approval.

6.0 Appendices

6.1 References

ADEM Administrative Code, 2002. Water Quality Program, Chapter 335-6-10, Water Quality Criteria, and Chapter 335-6-11 Use Classifications for Interstate and Intrastate Waters.

Alabama Department of Environmental Management's 303(d) Monitoring Program. 2008 and 2010.

Alabama Department of Environmental Management (ADEM). Alabama's Water Quality Assessment and Listing Methodology, December 2012.

EPA's *1999 Update of Ambient Water Quality Criteria for Ammonia*, EPA 822-R-94-014.

United States Environmental Protection Agency. 1991. Guidance for Water Quality-Based Decisions: The TMDL Process, Office of Water, EPA 440/4-91-001.

6.2 Water Quality Data

Toulmins Spring Branch Water Quality Data

Table 5: Station TSBM-1

Station ID	Visit Date	Flow CFS	NH3 mg/l	pH_SU	DO mg/l	T H2O C	EPA NH3 CCC
TSBM-1	3/28/2006	1.9	0.06	5.9	5	17	5.95
TSBM-1	4/13/2006	1.9	0.03	5.8	3.2	19	5.24
TSBM-1	5/17/2006	2.4	0.05	6.1	3.4	20	4.86
TSBM-1	6/13/2006	1.2	0.01	5.7	2.1	23	4.06
TSBM-1	7/6/2006	1.4	0.05	5.8	1.7	23	4.05
TSBM-1	8/14/2006	2.9	0.8	6.4	1.2	27	3.02
TSBM-1	9/21/2006	0.2	0.19	5.8	1.4	21	4.61
TSBM-1	10/3/2006	0.6	0.18	5.8	1.8	23	4.05
TSBM-1	8/9/2007	0.9		5.61	2.97	26.59	3.23
TSBM-1	3/10/2011	4.1997	0.06	6.9	7.8	13.5	6.12
TSBM-1	4/4/2011	1.7249	0.35	6.39	3.93	21.11	4.42
TSBM-1	5/12/2011		0.58	6.18	1.77	23.9	3.76
TSBM-1	6/20/2011		0.51	6.28	0.41	27.08	3.04
TSBM-1	7/11/2011		0.3	6.03	0.62	27.42	3.02
TSBM-1	8/22/2011		0.1	6.28	0.77	26.62	3.13
TSBM-1	9/26/2011		0.15	5.7	1.35	23.79	3.86
TSBM-1	10/12/2011		0.06	6.68	1.14	21.25	4.19

Total # of NH3 Samples Collected	Total # of NH3 violations	% of violations
17	0	0

Table 6: Station TSBM-2

Station ID	Visit Date	NH3 mg/L	pH SU	DO mg/L	T H2O C	EPA NH3 CCC mg/L
TSBM-2	3/28/2006	0.02	9.6	17.1	24	0.13
TSBM-2	5/17/2006	0.01	9.7	18.4	23	0.13
TSBM-2	6/13/2006	0.01	9.45	12.6	28.5	0.11
TSBM-2	7/6/2006	0.01	9.65	14.4	30	0.09
TSBM-2	8/14/2006	0.32	8.9	12.3	32	0.18
TSBM-2	9/21/2006	0.01	8.6	14.5	27	0.41
TSBM-2	10/3/2006	0.01	6.9	10.9	32	1.98
TSBM-2	3/11/2011	0.014	7.5	12.6	14.98	4.24
TSBM-2	4/4/2011	0.014	9.03	13.54	23.49	0.26
TSBM-2	5/9/2012	0.05	8.97	13.13	26.03	0.24
TSBM-2	6/5/2012	0.08	7.22	12.81	26.5	2.46
TSBM-2	7/12/2012	0.02	9.05	14.77	28.23	0.19
TSBM-2	8/9/2012	0.04	6.99	9.81	26.61	2.72
TSBM-2	9/13/2012	0.005	7.24	9.23	22.95	3.06
TSBM-2	10/11/2012	0.005	5.93	10.55	19.7	4.99
TSBM-2	11/8/2012	0.02	6.1	12.8	12	6.91

Total # of NH3 Samples Collected	Total # of NH3 violations	% of violations
16	0	0

6.3 Pictures of Stations

Figure 5: Upstream picture at station TSBM-1 (3/10/2011)



Figure 6: Downstream picture at station TSBM-1 (3/10/11)



Figure 7: Upstream picture at Station TSBM-2 (5/9/12)



Figure 8: Downstream picture at Station TSBM-2 (5/9/12)

